

**Compilation of comments to UNH's draft INSTREAM PROTECTED USES,  
OUTSTANDING CHARACTERISTICS, AND RESOURCES OF THE SOUHEGAN RIVER  
AND PROPOSED PROTECTIVE FLOW MEASURES FOR  
FLOW DEPENDENT RESOURCES - JULY 2004**

**The comment deadline was August 13, 2004.**

**Comments were received from:**

Angela Rapp, Nashua Regional Planning Commission

Spencer Brookes, Souhegan WMPAAC member

Doug Bechtel, The Nature Conservancy

William Ingham, NH Department of Fish and Game

Brian Mrazik, US Geologic Survey

Kenneth D. Kimball, Appalachian Mountain Club

Carl Paulsen, NH Rivers Council

Vernon B. Lang, US Fish and Wildlife Service

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From: Angela Rapp [<mailto:angier@nashuarpc.org>]

Sent: Friday, August 13, 2004 12:08 PM

To: Loskamp, Marie

Subject: Comments on IPUOCR Draft

Hello,

Overall, a lot of really good information! A lot of work was done in a small amount of time. This impressive.

My Comments: In general (and I get into the specifics for some sections where it was particularly obvious), the document needs to be formatted so that there is an obvious heirarchy of sections. Using Roman numerals with Letters (Large and Small) is really helpful in a document like this which is the first of it's kind for the Souhegan River. It's presenting information that is important for us to understand how it is being affected, especially considering all of the categories of resources and users that can be affected. It would have helped me read this report a lot easier.

1. Figure 2.1 on page 8: I understand the column heading for Flow Dep. but are the values: F, P and N? I am assuming that's supposed to be F for Yes it is flow dependent, P for Potentially and N for No? I think it would make more sense if it was Y, P and N.

2. Figure 2.1 on page 8: It might make it easier to read if it had lines on it...

3. Table 3.1 on page 13: Heading should be bolded to stand out.

4. Table 3.2 on page 14: Format of the tables is a little funky (i.e., headings capitalized/non-capitalized, extra spaces with no text in them, Table heading inside of a box when it wasn't inside of a box on page 13, etc.). It helps to have all of the tables and figures (including their headings and references to fish names...capitalized or not) consistent.

5. Table 3.2 on page 14: I think McQuade Brook is spelled with a capital Q.
6. On page 20, there is reference to Appendix 1. The Appendices are labeled with Roman numerals though...
7. Page 22: Figure 3.2's name isn't distinguishable from the rest of the text...the page has a confusing set up. The text and figure need to be separate and sections that are calling out specific attention (such as the conclusion drawn from the literature review) need to be clearer.
8. On page 23, there is a reference to Figure 2 towards the bottom...where is Figure 2?
9. On page 26, the font starts getting smaller towards the bottom of the page and stays smaller until page 36.
10. On page 37, at the beginning of the Hydrological/Geological/Habitat section it says River Morphology and Aquatic Habitat. Same comment as before, I would try and keep all section headings different from the rest of the text so that the reader can follow where you are. Keep the font and italic or non-italic the same too...
11. Where are the "reaches" mapped? Are those the transects? If so, they should be called one or the other. If not, I think they should be mapped so the reader can visually see where you are taking about.
12. It would be helpful to see the exact source of some of the tables/figures that you are using. For instance, under the section on Storage on page 42 you discuss the 12 dams and mention it is from NHDES in 2004. I would source that table with the link to where you found that information. Also, that table should have a Table number.
13. On Page 43: I would bullet the "Other" locations used for hiking, nature study, etc....it is hard to read right now. Same with the Conservation/Open Space items.
14. On Page 43/44: Seems like a map might be a good visual to break up some of the text in this section. And provide a visual placement of these locations.
15. On page 45: Why is the section called Vegetation called Vegetation when it is referring to Rhododendrons and the other sections are named appropriately for their subject matter (i.e., Siberian Chives, etc.).
16. On page 46: The section on Water Quality Protection/Public health should be italicized or something to distinguish it from the previous section on Maintenance and Enhancement of Aquatic Life.

Thanks for the opportunity to comment,

Angie

Angela J Rapp

Interim Land Use Program Coordinator/Senior Planner - Environmental Nashua  
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6572

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**From:** S Brookes [mailto:sbrookes@tds.net]  
**Sent:** Friday, July 30, 2004 7:57 AM  
**To:** Ives, Wayne  
**Subject:** Old Wilton Dump

The old Wilton Dump at the site of the Wilton Recling Center has had studies in the last 20 years. There were monitoring wells installed at the time of the closing of the dump. The dump perhaps should be noted in the report. The location is just West of RT 31N turn into Wilton Downtown on Gibbons Highway, RT 101 and just East of where the Souhegan River Bridge is located on the RT 101.

The potential of leaching into the river from the old dump may be worthy of note in the report.

Spencer Brookes

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10 July 2004

Marie Loskamp  
NHDES Watershed Management Bureau  
29 Hazen Drive  
Concord, NH 03301

Dear Marie,

Thank you for the opportunity to comment on the report, Instream Protected Uses, Outstanding Characteristics, and Resources (IPOUCRs) of the Souhegan River, and Proposed Flow Measures for Flow Dependent Resources, July 2004. These comments reflect both information in the July 2004 report and the presentation by the Protected Instream Flow project team (UNH, UMASS, Normandeau) on July 30, 2004.

The Project Team has proposed a strong approach for conducting the Protected Instream Flow (PISF) field studies, based on the final IPOUCR list. They have offered a thoughtful, thorough, and integrated approach to studying the full suite of IPOUCRs and should be able to provide depth and breadth of information on which to base recommendations for the Water Management Plan. We fully support using the Natural Flow Paradigm as an organizing principle for the PISF studies. In addition, while we offer fairly specific comments below, we generally support the proposed methods to develop science-based PISF recommendations.

Regarding Table 2.1 and the section of **Flow Dependence and Critical Flow Related Characteristics of IPOUCR Entities**, there were some inconsistencies between the text and the Table. For example, it was confusing to read that categories in the matrix (Table) included "the

resource, the reason for inclusion, the local, regional, and national importance of the resource, and the flow requirement of the resource . . .” Information on the reason for inclusion and the importance of the resource were not in the Table.

Secondly, there was no clear explanation of what constituted a “Critical Flow” for each resource and whether a flow is “critical” due to potential negative or positive impacts. For example, Critical Flows for Native Fish, Introduced Fish, Freshwater Mussels, Insects, Fish and Wildlife Habitat, Banded Sunfish, and others are listed as Low, when in fact High and Average flows may be equally critical to maintaining a full suite of habitat conditions for their maintenance and survival. Table 2.1 may be used in future decision-making settings, and it should reflect not only how IPOUCRs may be addressed in the PISF study, it should also reflect the ecological range of critical flows for each IPOUCR. We would encourage a short paragraph explanation of what constitutes Critical Flows; how they were assigned for each IPOUCR; and perhaps a revision of the Critical Flow categories for each based on the ecological requirements of each IPOUCR.

Regarding the **Resident Native Fish Community** Section, we support this approach to defining the suite of native fish species in the river. It was unclear what specific methods will be used to sample fish, other than a brief mention on page 26: “To verify our habitat database, we propose to include an instream community survey using underwater observation . . .” We encourage a more specific set of goals and methods to clarify what will be sampled, how it will be conducted and when. For example, will all fish be documented to species? Will there be sampling to verify current data on relative fish abundance? Will only dominant species be recorded? Will there be a focus on species that serve as host fish for freshwater mussels?

A recent paper in Fisheries Journal provides an excellent review of the utility and accuracy of Basin Visual Estimation Techniques, including a review of the accuracy and usefulness of snorkeling and fish shocking techniques<sup>[1]</sup>. We would recommend reviewing this paper to guide the refinement of field methods for the resident native fish community sampling.

Regarding freshwater mussels and insect (Odonate) sampling, we welcome the addition of these taxa to help represent a fuller range of aquatic biodiversity in making instream flow recommendations. Currently it is unclear how these IPOUCRs will be sampled in the field. While sampling them in the defined Hydrogeomorphic Units (HMUs) may be sufficient, both mussels and Odonates likely respond to habitat factors at a finer scale than fish. For example, mussel presence has been shown by Dr. David Strayer to be strongly influenced by local flow refugia which are at a scale smaller than a hydrogeomorphic unit. Identifying mussel beds and sampling microhabitat scale aquatic habitat characteristics (for example, substrate, flow velocity, and shear stress), and modeling changes in these characteristics over a range of flow magnitudes may shed light on their habitat needs. In addition, identifying and sampling for critical host fish should be an important part of the target native fish community sampling. Finally, a more complete set of goals and methods for Odonates should be developed and made available for review.

If it turns out that there are limited options to complete sampling of these taxa, the Project Team should propose alternative or surrogate methods or models to ensure Odonates and mussels are sufficiently considered. The proposal mentions developing a generic model for mussels and dragonflies, but it is unclear what this would entail.

We support the selection of the MesoHABSIM approach, and the use of CUT curves to depict flow thresholds. We also support the use of habitat modeling using cross sections of various riparian natural communities and wetlands. For the High-Energy Riverbank Community, it may be important to also consider winter ice scouring in the Water Management Plan, in addition to periodic high flows; both processes may be important to maintain these communities.

While we understand the reasoning to not include impoundments as low-flow dependent IPOUCRs, it is curious that several of the research reaches include, and in one case is dominated by, impounded water. While this may be characteristic of the river, it will be important to reflect the influence of dams within the context of the Natural Flow Paradigm.

While we recognize that the RFP limited the number of groundwater wells to be assessed, we would encourage (1) a broader assessment of the wells' potential impacts on instream flow, and (2) a survey and assessment of the potential effect of additional wells (i.e. those outside the 500 foot limit) along the Souhegan mainstem and the within the Watershed. For (1), an assessment limited to induced recharge / infiltration will likely underestimate the full impacts of wells on minimum instream flow. In particular, groundwater withdrawals affect base flows not only by inducing recharge directly from the river but also by intercepting groundwater that would have reached the river during critical low flow times. These impacts may in fact have an overall larger impact over the course of a year than just the induced infiltration. We strongly encourage an estimate of the full range of impacts from groundwater wells be included in the study. For (2), the water withdrawals from wells outside the 500' limit, whether along the mainstem or along tributaries, may combine to significantly reduce instream flow more than is reflected by the current list of AWUs. While we understand that a full assessment of all wells in the watershed may not be feasible under this scope of work, a management plan to protect the IPOUCRs may well include the need to understand the potential impacts from these withdrawals outside the 500' limit. We would encourage an approach that at least considers additional wells, and additional effects (beyond induced recharge) for groundwater withdrawals. The Water Management Plan may be the best tool for addressing this issue, but additional field studies may be required for the PISF report as well.

The discussion of Invasive Species was in the **Preliminary List of Non-Flow Dependent Entities** section, but in the text it stated that "these species are specifically flow dependent." These species are fundamentally different than IPOUCRs for which the state may wish to manage as they are a threat to the ecological integrity of many other IPOUCRs and should be addressed as such. We believe it may be more appropriate to have the IPOUCR be the "control of invasive species" rather than the invasive species themselves. We recommend that the control of both aquatic and riparian invasive species be addressed as flow dependent species, and that their presence and abundance is recorded during field studies.

Thank you. Please do not hesitate to call me with questions.

Sincerely,

Doug Bechtel  
Director of Conservation Science, The Nature Conservancy  
Souhegan Technical Review Committee

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<sup>[1]</sup> Williams, L.R. et al. 2004. Basin Visual Estimation Technique (BVET) and representative reach approaches to wadeable stream surveys: methodological limitations and future directions. Fisheries 29(8), 12-22.

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**From:** Doug Bechtel [mailto:dbechtel@tnc.org]  
**Sent:** Monday, August 02, 2004 2:11 PM  
**To:** piotrp@forwild.umass.edu  
**Cc:** William C. Ingham ; Alden Greenwood; Brian R. Mrazik; Carl Paulsen; Couture, Steve; Currier, Paul M.; Donald L. Ware; Ives, Wayne; James MacCartney; John R. Nelson; Kenneth D. Kimball; Ralph W. Abele  
**Subject:** Mussels in Souhegan

Hello Piotr,

Thanks for a good presentation on Friday.

As we discussed, I have attached an MSWord and Excel table with information on Souhegan freshwater mussels. Excel from the NH Heritage program and the Mussel Atlas from Mike Marchand (wetlands biologist with Nongame Program / NH Fish and Game, (603) 271-3016, [michael.marchand@WILDLIFE.STATE.NH.US](mailto:michael.marchand@WILDLIFE.STATE.NH.US)). I hope they are helpful. The spreadsheet has decimal Lat-Long for locations, as well as source and date of inventories.

-Doug

Douglas A. Bechtel  
Director of Conservation Science  
The Nature Conservancy - NH Chapter  
603-224-5853 x16 FAX:603-228-2459

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From: William Ingham [mailto:WIngham@WILDLIFE.STATE.NH.US]  
Sent: Tuesday, August 03, 2004 1:19 PM  
To: Loskamp, Marie  
Subject:

Marie,

The Preliminary Review Draft for the Instream Protected Uses, Outstanding Characteristics, and Resources of the Souhegan River and Protective Flow Measures for Flow Dependent Resources July 2004 should also include anadromous river herring and American shad in those species that are being evaluated. Reference to these species is found in the Anadromous Fish Restoration Plan for the Merrimack River Watershed.

Bill Ingham

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**From:** Brian R Mrazik [mailto:bmrazik@usgs.gov]  
**Sent:** Monday, August 02, 2004 3:23 PM  
**To:** Loskamp, Marie  
**Cc:** kkimball@amcinfo.org; tjmack@usgs.gov; ktoppin@usgs.gov; kwrobins@usgs.gov  
**Subject:** Comments on the proposed methodology presentations at the July 30 Souhegan meeting

Hi Marie,

Here are a few comments for consideration:

1. USGS/NHDES/USEPA have conducted significant ground-water investigations and modeling at the Savage Well Superfund site in Milford. This work has demonstrated that aquifer materials at this site are highly transmissive, and that ground-water flow through the contaminated area is highly affected by transients in river stage. The Souhegan River at the upstream end of the site is a losing (to ground water) reach and below the site, is a gaining (from ground-water) reach. Thus, the ground-water flux through the plume area varies considerably during the year. Alterations in the flow regime of the Souhegan River have the potential to affect the efficiency of remedial operations at the superfund site, and thus the cost and duration of the cleanup effort. Likewise, natural attenuation processes could be affected by alteration of the flow characteristics of the river.
2. The selection of a targeted native fish community and other native 'living resource' IPUOCRs will be a major consideration in establishing the Protected In-Stream Flow value for the Souhegan. On the other end of the spectrum, however, the project should consider the extent to which invasive species have, or are likely to become established in the Souhegan and its riparian zones, and how flow alteration could impact the relative competitiveness and abundance of native versus exotic species.
3. The contractor proposes to limit the investigation of ground-water withdrawals to wells within 500 feet of a stream channel and to where ground-water recharge is directly induced from the stream channel. Wells beyond 500 feet and wells within 500 feet that only intercept regional ground-water flow on its way to the river are proposed to be excluded from analysis. We are concerned that each of these simplifying assumptions will result in an underestimation of the impacts of ground-water withdrawals on the low flows of the Souhegan River, and that in combination, the underestimation may be quite significant. All ground-water withdrawals which are consumed, or diverted to other locations (e.g. downstream) in the basin will result in reduced river baseflows in the affected reach, regardless of whether the flow is lost directly from the stream channel (induced infiltration) or diverted to a well on its way to the stream channel. The rationale proposed, for not considering wells which are not directly inducing infiltration from the stream, is that there is a time lag between changes in withdrawal rates and subsequent changes in streamflow. Thus, 'management' of ground-water withdrawals from such wells will not have an immediate effect on flows in the Souhegan River. This rationale may be an unacceptable simplification. During periods of drought, flows in the protected reaches of the Souhegan may be below PISF levels for days, weeks, or longer periods that may well exceed the 'lag' time of regional ground-water flow between the well and the river. In other words, although a reduction in pumping may not have an immediate effect on river flows, the effect, in terms of increased river baseflows, could be realized in days or weeks....well before the critical low-flow situation in the river has ended.
4. The contractor is proposing to obtain concurrent flow measurements at the USGS gage(s) and several other sites in the basin in order to develop regression equations to predict flows at those sites based on flows at the USGS gage. During periods of critical low flow (i.e. at or near the PISF), reliance on flows from a gage at the downstream end of the basin to predict flows considerably upstream is likely to be highly unreliable. Flows at the PISF are most likely to occur during mid- to late summer and early fall. Precipitation during these periods is likely to be dominated by convective rather than frontal storms. Precipitation from convective

storms over basins the size of the Souhegan is extremely variable. Thus, to be reliable, any flow-prediction strategy for daily low-flows should include a component that accounts for variability in recent precipitation patterns over the basin.

Brian

U.S. Department of the Interior  
U.S. Geological Survey



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From: Ken Kimball [<mailto:kkimball@outdoors.org>]  
Sent: Thursday, August 12, 2004 10:56 PM  
To: Ives, Wayne; Loskamp, Marie  
Cc: Currier, Paul M.; Couture, Steve; tom.ballestero@unh.edu  
Subject: Re: Comments on UNH proposed ISF methods

Re: Appalachian Mountain Club Comments on the UNH ISF Soughegan Methodology

As a member of the Technical Review Committee overall I thought the UNH, U of MA and Normandeau Team have organized a tight and disciplined strategy. I offer the following comments and suggestions for the proposed ISF Study.

1) The selection of Habitat Suitability Indices (HSI) to be used for the organisms selected should show documented acceptance of them from federal and state resource agencies. It is my understanding that these will be the same /similar as the HSI used in similar studies in the immediate region by team members. But since HSI choice can strongly influence the modeling results, and the results when applied could be legally challenged at some point, the documentation of how the HSI were selected and that they had agency consultation in at least those processes would be beneficial.

2) I strongly urge that the flow requirements for navigation and recreational boating, a flow dependent value, be semi-quantitatively analyzed. This analysis should be conducted relative to flow needs to provide boating opportunities on a use by reach basis (flat water versus white water) under natural flow conditions. It is not necessary to study the issue from a water store and release perspective to provide an artificial opportunity.

The purpose of the study should be to gain insight on how much natural flow can be removed through water removals before it impedes the general boating experience under natural flow conditions. I agree that current



water withdrawals in this river likely have minimal effect on recreational boating. But even if the null hypothesis that current water withdrawals have no significant impact on recreational boating in this river at this time, this is the first NH river to be studied and this important parameter should be conceptually addressed and the precedence for a method established.

Considering that funds are not available for an extensive, quantitative boater study at different flows, and varying the flows artificially for a study is not a reasonable option, I suggest you use a Delphi or "professional judgment questionnaire using boaters experienced with the river to estimate flow ranges needed for the different boating experiences. George May, who is on the WMP, is an experienced boater who knows the river. He might be able to help identify other boaters familiar with the river to interview as to what flow ranges provide what types of boating experience on different parts of the river. In the whitewater reaches this should be divided into kayak versus open canoe, though I suspect for this river the differences would not be great.

The study teams float trips can also provide data on what levels provided boatable conditions by river reach and qualitative information -- scratchy, had to drag canoe, etc. in reach x or y during their studies for fisheries.

Thanks for considering these comments.

Kenneth D. Kimball  
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From: Carl Paulsen [[mailto:c\\_paulsen@nhrivers.org](mailto:c_paulsen@nhrivers.org)]  
Sent: Saturday, August 14, 2004 11:10 AM  
To: Couture, Steve; Ives, Wayne; Loskamp, Marie  
Cc: c\_paulsen@nhrivers.org  
Subject: Souhegan comments

Following are my comments for the Souhegan IPUOCR draft report. I was unable to submit by Friday due to lack of internet access. I hope you can still use my comments. I'll send a Word attachment when I return to the office on Tuesday. Thanks. Carl Paulsen, NH Rivers Council.

Wayne Ives  
Instream Flow Specialist  
NHDES Watershed Management Bureau  
29 Hazen Drive

Dear Wayne,

The following are my brief comments on the draft IPUOCR report for the Souhegan pilot study. In general I'm pleased with the work on the IPUOCR report, for example, the discussion of rare, threatened and endangered species which is quite thorough. My comments below focus on seven areas of concern I have with the report.

1. There appears to be a bias toward low flow protection and an assumption that summer low flows are the only important consideration (note that the discussion under Table 2.1 for aquatic life identifies only low flows as a concern, whereas there may be issues with spawning or incubation flows - while this too is a "low flow" issue for the species, it occurs at a non-low flow time in the river). While this may not be the intent of the contractor (they do mention, on p. 41, that the species with the "highest flow needs in particular (sic) season (e.g. spawning salmon in the fall) will be selected as indicators for PISF needs"), it should be clear that the protected flows could contain flushing flows, seasonal whitewater flows, spawning flows, etc.

2. It is unclear if the contractors reviewed municipal documents such as master plans, open space and recreation plans and related local documents to identify resources of community significance. While the preliminary review of the IPUOCR list by the TRC and the WMPAAC should have provided a reasonable source of this information, I'm concerned in particular that recent revisions of these documents may have been missed. I would recommend that the contractor review those documents to make sure flow dependent resources of particular concern to municipalities aren't missed.

3. There appears to be no examination of the role of hydrologic variability itself as an IPUOCR. We know that the full range of flow variability is important for hydrology, morphology, aquatic life support and so much more, and a focus on relieving low flows and (potentially) shaving high flows for storage runs the risk of severely leveling flows and destroying flow variability. Variability needs to be considered when management plans are developed, and it should therefore be discussed relative to its importance as an IPUOCR and in support of other IPUOCRs. The report does discuss hydrology, geology and habitat, but does not indicate any consideration of flow variability in their proposal for how to protect these features. Treating variability as an IPUOCR would ensure its consideration.

4. Under the discussion of insects, there is no discussion of the flow needs of benthic macroinvertebrates. I am not well versed in invertebrate zoology, but I would like to be certain that flow needs of these resources (vital to the full aquatic food web) are considered.

5. With #4 above in mind, I'd like to see some discussion of what is known (or predictable) about the broader ecological effects of flow alteration, such as trophic effects, changes in species distribution, etc. If, for example, a PISF to protect certain life stages of a fish along with management measures (such as skimming of peak flows)

to meet that PISF result in increased abundance of other species, might they out-compete the species of concern (or other resources) and therefore undo the benefit of the PISF (or cause other problems)?

6. The statement on p. 23 about balancing flow needs for aquatic life vs public and private water uses concerns me. It was my understanding that the flow setting process under the pilot rules was to identify and establish protected flows for the resources of concern to the river. Water supply itself is indirectly identified in the statute as a protected resource (at least basic "emergency" needs), while the remainder of human use is subject to the protected flow needs of the resources. It was very important in the negotiation process of the pilot projects that the science of flow needs be separated from the management decisions, and it should remain that way.

7. While the report discusses recreation, it seems to do so only from the standpoint of boating. That discussion is fairly good (though it's unclear if they are proposing that certain summer flows should be protected for flat water boating in the lower reaches - a factor that may be important but for which I don't have any personal knowledge), but it does not address swimming. In fact, Table 2.1 does not appear to list swimming at all, and subsequent discussions of recreation and community resources make no mention of swimming. I know that there are a number of traditional swimming holes along the Souhegan that are of local importance (though perhaps not specifically identified in municipal planning documents) that should be considered.

Once again, aside from these issues, the draft is quite good.

Carl Paulsen

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August 10, 2004

Ms. Marie Loskamp  
NH DES Watershed Management Bureau  
29 Hazen Driven  
Concord, NH 03302-0095

Dear Ms. Loskamp:

In accordance with the recent request for review and comments on the draft Souhegan River Flow Study, July 2004, we have the following comments to offer.

Page 2. We are concerned that the flow-dependent aquatic species/life stages are limited to the summer period. Native fall spawning fish such as brook trout and Atlantic salmon need to be considered during the fall/winter period. If spring spawning stocks are dependent on overbank flooding or flooding of backwater areas, this could also be a critical flow period.

Page 9. The line for aquatic and fish life in Table 2.1 needs to be modified to account for the discussion above. In addition, the method assessment column would need to be modified since

Page 11 of 14  
9/3/2004

hydraulic simulation techniques are not reliable under ice conditions. Critical flows may also include fluctuating flows.

Page 10. The wood turtle should be evaluated for fluctuating flows and low flows.

Page 13. The native fish community is proposed to be divided into two separate communities. We agree that it should be at least two communities and remain undecided if a third is appropriate for the Wilton-Milford reach.

Page 16. We suggest that American eel be deleted from Table 3.3. The spawning period for brook and brown trout appear to be overly broad for this part of their range. We would expect a late October-November time period for these species.

The discussion on native fish species should be considered a works-in-progress topic. We are uncertain about the status of spottail shiner, burbot, slimy sculpin, sea lamprey and brook lamprey in the Souhegan.

Page 17. We do not believe sufficient reason has been given to support the conclusion that Odonates are the most important insect order for purposes of this study. Certainly, they are an important order in the reach below Milford, but do they take priority over all insects? Our limited exposure to the river suggests that the EPT group (mayflies, stoneflies, and caddisflies) would be a sensitive group, especially in the reaches above Milford.

Page 22. We are not in agreement with the current construction of Figure 3.2. In our view, 7Q10 should be deleted. Natural flow/run-of-river should be put in its place. Tennant is acceptable as a generic standard setting method. IHA is acceptable as a generic standard setting plus method. We assume the acronym ROV is range of variation, however, both IHA and ROV should be spelled. Under the horizontal axis, the words resource importance should be deleted and in their place, insert negotiation process.

These changes are intended to make it clear that less tinkering is better. We ordinarily recommend a natural flow condition as the best means of protecting native aquatic life. Incremental and simulation techniques were developed to better integrate flow studies with institutional analysis and negotiation processes. The incremental and simulation techniques are not the first choice of the Service to protect important resources.

Page 23. In the first paragraph under selected methods, we are puzzled by the reference to “balancing” in this instream flow study. Our understanding is that “balancing” would be considered in the water management plan phase.

In the last paragraph, the acronym HM should be spelled.

Page 26. Task 3 may need to be expanded to include fish collection work to verify the existing fish community. It should not be limited just to fish observations.

Page 28. The proposal to determine wood turtle hibernacula and protective flows during the emergent wetland survey is cause for some concern. A more appropriate time may be late fall before ice cover when turtles are using their hibernacula. We would like to know more about the

process the team will utilize to determine protective flows for wood turtles and other aquatic life under ice conditions.

Page 36. The discussion on floodplain forest could benefit from some minor editorial change. Our observation is that below Milford, the silver maple floodplain forest is dominant, while above Milford, the red maple floodplain forest is dominant.

While not listed in the draft report, we learned at the July 30 meeting that the Souhegan watershed may have been subjected to a flood control project by the Soil Conservation Service PL 566 program during the 1950-60 decade. If flood retention structures were built, this could affect stream temperature, hydrology and aquatic communities.

Questions should be directed to me at 603-223-2541 or email [vernon\\_lang@fws.gov](mailto:vernon_lang@fws.gov).

Sincerely yours,

Vernon B. Lang  
Assistant Supervisor  
New England Field Office

CC: R. Abele, EPA  
S. Decker, NHF&G  
D. Bechtel, TNC  
K. Kimball, AMC  
J. McCartney, TU  
Reading File  
ES: VLang:jd:8-10-04:603-223-2541